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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/051,267	01/18/2002	Tsutomu Tanaka	9792909-5359	2710
26263	7590	06/08/2004	EXAMINER	
SONNENSCHN NATH & ROSENTHAL LLP P.O. BOX 061080 WACKER DRIVE STATION, SEARS TOWER CHICAGO, IL 60606-1080			TRAN, THIEN F	
			ART UNIT	PAPER NUMBER
			2811	

DATE MAILED: 06/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/051,267

Applicant(s)

TANAKA ET AL.

Examiner

Thien F Tran

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pm

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 March 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 10 and 12 is/are pending in the application.
- 4a) Of the above claim(s) 10 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/23/2003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Drawings

The drawings were received on 03/17/2004. These drawings are not acceptable.

The drawings are objected to because the specification does not teach that the gate insulation film 6 being etched all the way through so that the contact hole 16 reaches the top surface of the substrate 1. There is no support in the specification and the drawings as originally filed and the examiner sees no need for the gate insulating film 6 to be etched all the way to substrate 1 when the specification only discloses the contact holes 16 making contact with the active layer 7. It is not necessary, more expensive as well as more difficult to etch through the gate insulating film when there is no need to do it. Page 15, lines 9-13, the specification should state that contact holes 16 are made by etching the interlayer insulating film 13 and the protective insulating film 8, as shown in FIG. 3B. Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in

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the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description: FIG. 3A to FIG. 3D. Corrected drawing sheets, or amendment to the specification to add the reference character(s) in the description, are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawasaki et al. (USPN 6,281,552) in view of Yamazaki et al. (USPN 6,246,070).

Kawasaki et al. discloses a bottom-gate thin film transistor (Fig. 2C) comprising a gate electrode 104, a gate insulating film 105, an active layer 106, an LDD region 146, a source-drain region 149, and a protective insulating film 150 formed in that order on a substrate 101; and plurality of layers (151, 157, 158) formed over said protective film with one electrode (156, 161) extending therethrough that is operatively and electrically connected to one of the active layer; wherein the protective insulating film has a thickness of 100 nm, and the protective insulating film is formed on the active layer. The resist mask disclosed in col. 6, lines 24-30 and the new resist mask 126 in col. 7, lines 9-20 are removed and no longer existed in the final structure as shown in Fig 2C. Therefore, there is no etched mask structure within the thin film transistor structure.

Kawasaki et al. does not disclose the protecting insulating film 150 having a thickness of between about 5 and 50 nm. However, forming a protecting insulating film having the claimed thickness is known in the art as shown for example by Yamazaki et al. Yamazaki et al. discloses a protecting insulating film (105,108) having a thickness of 5 to 50 nm (Fig. 3). It would have been obvious to a person having ordinary skill in the art at the time the invention was made to form the protecting insulating film of Kawasaki et al. having the claimed thickness as taught by Yamazaki et al. in order to protect the surface of the active layer 106 against pollution by impurities and reduce structure thickness to increase device density.

Regarding claim 2, the active layer (crystalline silicon film 106) is formed by laser crystallization which inherently comprises a polysilicon film.

Response to Arguments

Applicant's arguments with respect to claims 1-2 have been considered but are moot in view of the new ground(s) of rejection.

Applicant's arguments filed 03/17/2004 have been fully considered but they are not persuasive. Applicant argues that there is no motivation or suggestion within Kawasaki or Yamazaki to replace the protective insulating film 150 of Kawasaki with the insulating film (105, 108) of Yamazaki. The examiner respectfully disagrees with the remark because the protective insulating films in Kawasaki and Yamazaki both using the same materials. Therefore, there is no need to substitute one for the other. The examiner relies only on the teachings of the thickness of the protective insulating film (105, 108) by Yamazaki in the range of 5 and 50 nm that are thin but sufficient to protect the active layer against pollution and reduce structure thickness to increase device density. As a result, reducing the thickness of the protective insulating film 150 of Kawasaki from 100 nm to 5 and 50 nm would have been obvious to increase device density but at the same time be able to protect the active layer below from pollution. Also, for device claims, it would not be matter how the device is formed (the artisan can use any method known in the art, not necessary the methods used in Kawasaki or Yamazaki, to form the recited structure based on the combined teachings of Kawasaki and Yamazaki); what would be matter is that some advantage or expected beneficial result would have been produced by their combination. In re Sernaker, 702 F.2d 989,

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217 USPQ 1, 5-6 (Fed. Cir. 1983). The teachings of the references thus would be combinable given the explicit incentive provided by Yamazaki. The expected beneficial results thus are evidence of obviousness. Furthermore, Kawasaki does not teach that the thickness of the protective insulating film 150 of Kawasaki cannot be less than 100 nm. Therefore, it is permissible to form the protective insulating film 150 of Kawasaki within the claimed range as suggested by Yamazaki as long as it does not change the principle of operation of the primary reference or render the reference inoperable for its intended purpose.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thien F Tran whose telephone number is (571) 272-1665. The examiner can normally be reached on 8:30AM - 5:00PM Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

tt
June 4, 2004


THIEN TRAN
PRIMARY EXAMINER